CLAIMS

We claim:

1. A magnetic recording head for writing data onto a magnetic recording medium, the head comprising:

a first pole and a second pole separated by a gap;

- a coil structure traversing through the gap;
- a waveguide extending through the gap, in a plane distinct from the first pole plane and the second pole plane; and
- a closure partially connecting the first pole and the second pole near the back gap to decrease a magnetic reluctance and increase a write efficiency of the recording head.
- 2. The device of claim 1 wherein the closure is split and wherein the waveguide travels through the split such that a light source can travel in a straight path from an entrance of the waveguide to the write gap area of the head.
- 3. The device of claim 2 wherein the light is transduced onto the magnetic recording medium.
- 4. The device of claim 1 wherein the waveguide is disposed between the first pole and the coil layer.
- 5. The device of claim 1 wherein the waveguide is disposed between the second pole and the coil layer.
- 6. A load beam assembly for transducing data with a concentric track of a magnetic recording medium, the assembly comprising:
 - a slider including an air-bearing surface;
 - a transducing head mounted on a trailing face of the slider, the transducing head having a first pole and a second pole;

a light source attached near the trailing face; and
a waveguide extending generally straight down from near an upper
edge to near a lower edge of the trailing face, such that the
waveguide is disposed in a distinct plane between the first
and second poles.

- 7. The device of claim 6 wherein the light source is a solid-state laser diode.
- 8. The device of claim 6 further including a closure partially connecting the first pole and the second pole near the back gap to decrease a magnetic reluctance of the recording head.
- 9. The device of claim 8 wherein the closure is split to allow the waveguide to extend between a first portion and a second portion thereof.
- 10. The device of claim 6 wherein the transducing head further includes a transducing coil, the transducing coil extending between the first and the second poles.
- 11. The device of claim 6 wherein the laser source includes a laser emitting face and further wherein the laser emitting face is disposed generally opposing an upper face of the slider.
- 12. The device of claim 7 wherein the power output of the solid-state laser diode is sufficient to cause heating of a portion of the magnetic recording medium located near a write gap to a Curie temperature of the heat assisted recording medium.
- 13. The device of claim 6 further including a flexure adapted for supporting the slider and the light source.

- 14. The device of claim 13 further including a silicon bench assembly for changing a direction of a light beam exiting the light source.
- 15. The device of claim 6 wherein the light source is attached to the trailing face, such that a face of the light source is in contact with the trailing face.
- 16. A method of fabricating a head/load beam assembly for writing data to a concentric track of a magnetic recording medium, the method comprising:

providing a slider having an air bearing surface;
forming a transducing head on a trailing edge of the slider, the
transducing head including a pole having a split back gap;
forming a waveguide on the trailing face of the slider, the
waveguide extending through the split back gap; and
mounting a laser source near the trailing edge of the slider.

- 17. The method of claim 16 wherein the laser source is a laser diode having a power output from about 1 to about 25 mW.
- 18. The method of claim 16 wherein the laser source includes a light emitting face and further wherein the light emitting face is in optical communication with a proximal end of the waveguide.
- 19. The method of claim 16 further comprising providing a flexure for supporting the slider.
- 20. The method of claim 16 wherein the waveguide extends in a distinct plane between the pole and a transducing coil.